MICR*2430 Methods in Microbial Culture and Physiology

Fall 2018
Section(s): C01

Department of Molecular and Cellular Biology
Credit Weight: 0.50
Version 1.00 - August 24, 2018

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1 Course Details

1.1 Calendar Description

This course uses a hands-on approach to investigate microbial growth and factors that impact growth and the interactions of microbes with biotic and abiotic environments. This course will explore the ecological diversity of microorganisms of selected environments. Students will develop a wide range of microbiology-related laboratory skills.

Pre-Requisite(s): MICR*2420
Restriction(s): This is a Priority Access Course. Enrolment may be restricted to particular programs, specializations or semester levels during certain periods. Please see the departmental website for more information.

1.2 Timetable

1. Seminars Tues. 11:30 - 12:50 pm, MAC149
2. Labs Thurs. & Fri. 2:30-5:30 pm, SSC4102

- labs begin Sept. 12-14

1.3 Final Exam

Wedsday Dec. 12 2:30-4:30
Location TBA
Exam time and location is subject to change. Please see WebAdvisor for the latest information.

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2 Instructional Support

2.1 Instructor(s)

Wendy Keenleyside

Email:	wkeenley@uoguelph.ca
Telephone:	+1-519-824-4120 x53813
Office:	SCC 3506 (Summerlee Science Complex)
Office Hours:	Individual meetings by appointment.
	Group office hours – TBA

- Included in topics for discussion in these office hours (in addition to course concepts): strategies for deeper learning, more effective studying, readi

2.2 Instructional Support Team

Lab Co-ordinator:	Debra Flett
Email:	dflett@uoguelph.ca
Telephone:	+1-519-824-4120 x52533
Office:	SCC 3504

2.3 Teaching Assistant(s)

Teaching Assistant:	Joshua Chun
Email:	jchun01@uoguelph.ca
Teaching Assistant:	Megan Brasher
Email:	mbrasher@uoguelph.ca
Teaching Assistant:	Victoria Sanderson
Email:	vsande01@uoguelph.ca

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3 Learning Resources

3.1 Required Resource(s)

Microbiology (Textbook)
https://openstax.org/details/books/microbiology#faculty-resources

This is an Open resource e-book and is currently being updated for MICR2420 & MICR2430. The augmented version of this textbook, by Keenleyside *et al.* will be available online, by the beginning of the fall semester and the url will be posted on Courselink.

Laboratory Manual (Lab Manual)
Purchase in SSC3302, $20.00 CASH ONLY & exact change

- Thursday, Sept. 6: 9:30am – 11:30am & 1pm – 3pm
- Friday, Sept. 7: 9:30am – 11:30am & 1pm – 3pm
- Monday, Sept. 10: 9:30am – 11:30am & 1pm – 3pm

Courselink (Website)

https://courselink.uoguelph.ca

The course website will be used extensively and will include all relevant course materials, including lecture videos, online quizzes, discussion boards, group lockers, links for additional readings, , group drop boxes and a course calendar will provide all relevant information on due dates.

Lab Schedule & Information Handout (Other)

Detailed, colour-coded breakdown of weekly lab and case study activities, due dates, marking schemes, (specifically for the case study). This will be posted and the relevant dates identified in the Courselink calendar.

REEF Polling (Software)

You will be required to purchase a subscription to REEF Polling (by iclicker), to allow participation in class polling. This is a cloud-based platform that allows you to use your laptop or digital device to respond to MCQs, short answer or targeting questions; ***the hand-held iclickers will not be used***.

For those that did not purchase a subscription in the summer:

- The access code is purchased at the bookstore - please keep this code until you are certain it has been entered correctly and you are able to participate in polling.
- Once you have the access code, you will need to register online
- To give students time to purchase this,polling will begin on lecture 2
- The site is accessed through Courselink

PEAR Tool (Website)

https://www.uoguelph.ca/peartool/user/signon.cfm?destination=index%2Ecfm

UofG online platform for **P**eer **E**valuation **A**ssessment and **R**eview. This will be used for the peer evaluation component of the Case Study Ch. 2 concept questions, and for the final anonymous evaluation of the distribution of effort among team members.

PeerWise (Website)

https://peerwise.cs.auckland.ac.nz/docs/

This is a free online tool for authoring, answering, commenting on and rating student-authored multiple-choice questions. A site for MICR*2430 W17 will be set up and the class list imported as soon as the add deadline has passed. You will need to create an account (assuming you have not used the tool before) and then select the course. The tool is simple to use but instructions for creating, and for answering, questions, are provided in text as well as video on the PeerWise site and criteria for high quality MCQs will be discussed in class. Dr. Keenleyside will provide some introductory/review questions to the MICR*2430 repository, to help you get started and seminar 1 will include a brief discussion of Bloom's taxonomy and what makes good, higher level MCQs. Any good quality, higher Bloom's level questions, will be considered for inclusion in the midterm and final exams, with no upper limit! So you will derive double benefits from authoring and answering/providing feedback on, other questions: you will be learning as you do both, and you raise the likelihood that you will know some questions AND THEIR ANSWERS on the midterm and final exam! Participation can also be used to make up for missed REEFPolling and seminar reading quizzes, to a limit.

3.2 Recommended Resource(s)

Team Outlook Calendars (Website)

Once case study teams have been created, members are encouraged to establish a shared team calendar to ensure all established and internally-agreed upon deadlines and meeting dates are readily accessible.

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4 Learning Outcomes

Course Goals

This course is designed as an active learning course, where students learn the concepts of microbial growth, metabolism, cultivation and ecology, through independent reading, group discussions in class, and lab work which includes, in the second half of the semester, a case study and case study teams. Note that the case study will simultaneously cover a majority of the course LOs as well as the broader MCB program Learning Outcomes (including Problem solving & Critical thinking, Communication, Professional & Ethical behaviour) and the University of Guelph learning outcomes (including Critical & Creative Thinking, Literacy, Communicating & Professional & Ethical Behaviour).

4.1 Course Learning Outcomes

By the end of this course, you should be able to:

1. Demonstrate an understanding that chemical transformations of biological molecules are catalyzed by enzymes organized in metabolic pathways, and that these pathways are regulated
2. Understand and appreciate the metabolic diversity among eukaryotes, prokaryotes and archaea
3. Be able to describe how thermodynamically unfavourable processes occur
4. Understand that the properties of cells are a function of the chemical structures of their constituent macromolecules and be able to describe some of the macromolecular interactions essential to cell function
5. Appreciate the roles of cells as the fundamental unit of life and the role of the prokaryotes in the evolution of eukaryotic cells, their organelles, and the major metabolic pathways
6. Demonstrate an understanding of communication within and between cells and their environment
7. Demonstrate an understanding of the molecular structure, function and regulation of genes and genomes and be able to explain, with examples, how environmental factors may affect the frequency of genotypes and phenotypes in a population
8. Successfully design and explain experiments for the isolation, identification and enumeration of microbes or assess such proposals
9. Perform experiments using appropriate safety precautions, and microbiological techniques for the isolation, identification and enumeration of representative groups of bacteria and fungi
10. Use appropriate and accurate mathematical calculations and statistical analyses and

assess the reliability of data using biological and technical replicates

11. Successfully interpret and communicate scientific data in laboratory reports, group assignments and tests
12. Through open and regular communication between team members, learn to become an effective research team, understand the essential difference between a group and a team, and further develop team skills
13. Demonstrate a good work ethic by setting goals, meeting deadlines and working cooperatively and responsibly with team members

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5 Teaching and Learning Activities

5.1 Course Content: Seminars

Seminar #	[a]Seminar Topic # and description	[b]Readi
#1 Sept. 11	Introduction to course & active learning format. Cellular composition and nutrition. Molecular composition of bacterial cells; macronutrients, micronutrients, growth factors; growth media, oligotrophy vs copiotrophy, diazotrophy	**Miyats** . Five p strateg pitfalls implem Perspe Sci. 13 **Microb** 7 & Ch manua
#2 Sept. 18	Microbial growth and enumeration. Batch culture & growth curve; continuous culture; cellular enumeration methods	**Microb** 9.1 & la
#3 Sept. 25	The cell membrane and transport. Fuid mosaic membrane; diffusion, primary and secondary transport systems	**Microb** 3.3 & la
#4-5 Oct. 2 &16	Environmental influences on microbial growth. Temperature, water activity and salt, pH, oxygen, antimicrobials	**Microb** 9.2-9.5 lab ma
#6 Oct. 23	Midterm -held during the first 50 minutes of the seminar. Short class to follow. The biochemistry of catabolism. Introduction - energy and entropy, energy carriers and electron transfer	**Microb** 8, Met Pathwa manua
#7-9	The biochemistry of catabolism. Energy acquisition in bacteria and archaea,	**Microb**

Oct. 30-Nov. 13	electron transport chain.	8, Met Pathwa manua

[a] these are approximate dates and are subject to minor alteration.

[b]readings beyond the textbook are provided via link or pdf on Courselink

5.2 Course Content: Labs

Week	Lab Topic
1 Sept. 12-14	Exp. 1 - Soil microbiology: growth media, isolation and enumeration techniques, enrichment cultivation
2 Sept. 19-21	Exp. 2 - Bacterial physiological diversity: effect of environmental & nutrient conditions on growth, enrichment cultivation
3 Sept. 26-28	Exp. 3 - Water quality testing: diagnostic media and tests for identification and enumeration of coliforms, fecal coliforms & enterococci
4 Oct. 3-5	Exp. 4 - Comparative cell counting: viable plate counting & direct microscopic counting Exp. 7 - Introduction to Microbial ecology & the Winogradsky columns: macroscopic observatio
5 Oct. 10-12	Exp. 5 – Batch culture & the growth curve: viable plate counting & optical density for E. coli growth curve Exp. 7 - Introduction to Microbial ecology & the Winogradsky columns: microscop & macroscopic observations
6 Oct. 17-19	Exp. 6 – Biochemical tests part 1: oxidase, catalase, KOH, nitrate, O-F, extracellular enzymes * **Introduction to team members & Case study**
7 Oct. 24-26	Exp. 6 – Biochemical tests part 2: CHO fermentation, peptone iron agar, urease Case study - *Delicate Balance, Deadly Obsession* Lab exercise CS1: Triclosan in aquatic environment, selection of triclosan resistance
8 Oct. 31-Nov. 2	Case study Ch. 1 – CS1 conclusions & team discussion Ch. 1 concept question team discussions & Ch. 1 IF-AT quiz Case study Ch. 2 Lab exercise CS2: Microbial catabolic & physiological diversity, isolations fro Winogradsky columns
9	Case Study Ch. 2 – CS2 observations, conclusions & team discussions

	Nov. 7-9	
10	Nov. 14-16	Case study Ch. 2 – CS2 final observations, conclusions & team discussion Ch. 2 concept question team discussions & Ch. 2 IF-AT quiz
11	Nov. 21-23	Lab exam - cumulative (all lab exercises including those from the case study), individual bell-ri component

- Case study readings are given in the case study, published in the course manual. Other readings are provided via link or pdf on Courselink

5.3 Method of Presentation

Students will learn the techniques and concepts through seminars & lab sessions and will use a combination of independent reading, lectures, laboratory exercises, online reading quizzes, group/team discussions (online and face-to-face), team work on an interrupted case study, REEFPolling questions and collaborative tests/test questions. Seminars will be recorded and made available following the seminar. These will be highly interactive, employing a combination of short lectures, followed by group discussions on problems, classroom polling and follow- up discussions. **Simple concepts and definitions will be itemized and covered through independent reading, laboratory exercise introductions, and reading quizzes, but will not be covered during class.**

5.4 Teamwork

This is a major component of the course due to the documented advantages of peer discussion and instruction to facilitate deeper learning, as well as being a critical skill in the workplace. Prior to the midterm, students will work in the lab in pairs, and will form ad hoc groups for group discussions in the seminar. Immediately prior to the midterm, students will be introduced to their team members, and will write the group component of the 2-stage midterm, in their teams. They will continue to work together in the lab and online/outside of class time, on the case study, the group component of the lab exam, and the 2-stage final exam. Seminars will continue to involve ad hoc groups for discussions/problem solving. Teams will be constructed following best practices, using student answers to a Qualtrics survey administered weeks 4-5. While attempting wherever possible to combine 3 preexisting lab pairs, in instances of odd lab numbers, 1 or more pairs will be split. Team member accountability will be ensured through a Team-written “Team Charter”, an initial “Team Effectiveness” group report, and finally, through anonymous peer evaluations using the UofG PEARTool. The average scores from those anonymous assessments will be used to assign individual case study grades from the team grade.

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6 Assessments

6.1 Marking Schemes & Distributions

Midterm grade weight transferred to final exam if a) final exam grade is higher, or b) student does not write the midterm

Name	Scheme A (%)	Scheme B (%)
REEFPolling	3	3
Seminar reading quizzes	3	3
Pre-lab quizzes	1	1
Laboratory quizzes	1	1
Laboratory reports	15	15
Laboratory skills tests	1	1
Laboratory flowcharts	1	1
Midterm	10	0
Case study	20	20
Laboratory exam	15	15
Final exam	30	40
Total	100	100

6.2 Assessment Details

REEFPolling (2%)
Date: Seminars 2-12
Students will be polled using a variety of formats (Multiple-choice, multi select, targeting, word clouds), multiple times per seminar. During the second half of the semester, when students are working on their case study, seminars will be more interactive with more frequent polling. Students receive one mark per response and their grade is determined by the percentage of questions answered versus the total questions polled.

Seminar reading quizzes (2%)
Date: Seminars 2-4 & 7, Through Courselink
On text book readings assigned the previous week; reading guides are provided.

Bonus activities (0%)

- 1.5-2.0% bonus mark on final grade possible
- Free online platform for student-authored MCQs on course material: https://peerwise.cs.auckland.ac.nz/at/?uoguelph_ca
- Can be used to recover lost marks from classroom polling. This bonus grade will be added onto the 2.5% polling grade, which will be allowed to exceed 100%. 1 mark per authored PEERWise question, 0.5 marks per PEERWise question answered, to a maximum of 10 marks

Pre-lab quizzes (1%)
Date: Weeks 1-6, Through Courselink

- Course Content: Laboratory exercises 1-6
- Online, available Mon-Fri, on that week's lab. 30 min. for each of 2 attempts, best mark counts

Lab quizzes (0%)

Date: Weeks 1-4 & 6, At the beginning of the lab period
Week 1: lab safety

Weeks 2-4: dilutions

Week 6: biochemical tests

Laboratory reports (15%)

Date: Laboratory exercises 1-6
Reports are due at 2:30 p.m. in lab. Dates are identified in the "F18 lab schedule and information" file.

Laboratory skills tests (1%)

Date: Weeks 3, 7 & 9, in lab
Students are given a mixed culture, from which they need to perform a Gram stain and obtain isolated colonies

The two best marks are used.

Laboratory flowcharts (1%)

Date: Weeks 1-9, In lab
For each lab, students must arrive with a flowchart that days' procedures.

Midterm (10%)

Date: Tue, Oct 23, 11:30 AM - 12:20 PM, In class

- On material covered up to, and including, the previous week's seminar, and any directly related material from the lab.
- 8.5% individual + 1.5% group = 10%
- Consists of individual, followed by group tests using IF-AT cards (http://www.epsteineducation.com/home/).
- Group components will be written in case study teams and grade will only be used if it is no lower than the individual grade.
- Individual midterms will not be handed back but multiple opportunities to view the midterms and answer keys will be provided.
- Because of the nature of the 2-stage exams, students writing in SAS need to talk to Dr. Keenleyside ASAP to discuss options.
- Textbook content that is tested but not covered in class is the more basic material (e.g. definitions) identified in the posted reading guides and usually also covered in the introductions to lab exercises 1-6.

Case study (20%)

Date: Weeks 7 to 12, In the lab and outside of class

- Course Content: "*Delicate Balance, Deadly Obsession*"
- Individual grades assigned based on the (team grade) x average score (as %) from the team's distribution of effort assessments

Lab exam (14%)
Date: Week 11, In lab

- Course content: Techniques/ concepts from lab exercises & case study material covered to date
- Individual bell-ringer + written (in case study teams)

Final exam (30%)
Date: Date and location TBA

- Course Content: Cumulative including textbook readings, lab and case study material
- 25.5% individual + 4.5% group = 30%
- Consists of individual, followed by group tests using IF-AT cards (http://www.epsteineducation.com/home/).
- Individual includes MCQs & a take-home final exam question (short answer)
- Group components will be written in case study teams and grade will only be used if it is no lower than the individual grade.
- Because of the nature of the 2-stage exams, students writing in SAS need to talk to Dr. Keenleyside to discuss options ASAP.
- Textbook content that is tested but not covered in class is the more basic material (e.g. definitions) identified in the posted reading guides and usually also covered in the introductions to lab exercises 1-6 and the case study questions.

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7 Course Statements

7.1 Grading

1. Midterm - students who MISS the midterm write a 40% (cumulative) final exam. For students who DO write the midterm, but perform better on the final, the midterm grade will be dropped and the grade weight transferred to the final exam.
2. Assignments/reports – lab reports are due by 2:30 pm on the due date; the time for submission of other assignments is identified above (usually 9:00am either on the day of the seminar or the lab period). For lab reports, deductions for late submissions will be 10% per day (the weekend counts as a 20% grade reduction), up to a 30% deduction. After 3 days, the submission will not be accepted.
3. Quizzes - pre-lab quizzes (PLQs) are online, available M-F and students are expected to complete all 6. Each quiz has a 30-minute time limit and two attempts are given with the best mark counting. Students who fail to write 1 or more of these must provide documentation in support of academic consideration in order to obtain an adjustment to their distribution of marks. Lab quizzes (LQs) are written at the beginning of lab periods 1-

4 & 6. Students with valid grounds for being unable to complete one or more of these must talk with the lab coordinator about either writing the quiz at another time, or, provided with appropriate documentation, may have that quiz dropped from the calculation of the lab quiz grade. Reading quizzes are online, available Thurs-Tues, on on the textbook readings assigned for the next seminar. Students who fail to write 1 reading quiz may make up the marks via PEERWise participation; students who miss more than 1 must provide documentation in support of academic consideration in order to obtain an adjustment to their distribution of marks.

4. Collaborative tests (midterm & final exams) - the individual grade will contribute 100% of that grade item if higher than the collaborative component. Students who choose to write the individual component only will similarly have that count as 100% of that grade item. Students registered with SAS may a) write early so that they can join the class for the collaborative portion, or b) write a 100% individual test or c) get the class average of the group test as their group component.

7.2 Emails

1. Student enquiries will not be answered on nights, weekends or holidays. Student e-mails from non-UofG accounts will not be answered.
2. E-mail enquiries for which the answer is easily available by checking the lab manual, course outline or other information on courselink will not be answered.
3. Questions about any of the online quiz questions will not be answered until after the quiz closes for everyone, and only if the answer cannot then be resolved by examining your own answers against the marking key.

7.3 Student Responsibilities

1. Respectfulness: students are expected to treat teammates, classmates, the instructor and teaching staff with respect at all times. In class, this means paying attention, not talking while the instructor or another student is talking, not sending or receiving text messages or phone calls once class has started.
2. Lab attendance is mandatory. If you cannot attend a laboratory session, and have valid grounds, please e-mail the lab coordinator to provide your documentation and enquire about making up the missed activities. Academic accommodations for instances where a student cannot meet a course requirement, are discussed below.
3. Laboratory preparedness: You must have read the relevant laboratory exercise in advance of the lab, and completed the online quiz for that week, prior to coming to the lab. A flow chart for what you will be doing in the lab is to be provided for grading at the beginning of the lab. These flow charts will ensure you finish in less than the scheduled 3h. You must bring with you: closed-toed shoes, a lab coat, your lab manual, an elastic band for long hair, and a notebook. If you wear contact lenses, you must also bring safety glasses.
4. Working in pairs or teams: Lab partners are expected to work collaboratively, to communicate effectively with each other and the GTAs/lab coordinator, and to hand in independent lab reports. Following the midterm, the teams of 6-7 will negotiate and sign

the terms of a team charter and will discuss and provide preliminary feedback (“Team Effectiveness Feedback”) and final anonymous distribution of effort evaluations of their team members. The team as a whole will use the individual results of the early evaluation to identify and report their agreed-upon steps for improving performance. The final evaluation is done individually and will be used to assess individual grades based on the team mark. The individual grade may go UP or DOWN, relative to the group grade, within limits. As with work-place teams (which are the norm, even if you are a CEO), the development of an effective team requires effort, communication and skill but results in a synergy that leads to performance, creativity and productivity that are superior to what a single member working alone can accomplish.

5. Seminar preparedness: Seminars are highly interactive. In order to arrive prepared, you must have done the assigned readings and reading quiz. Names, terms and definitions for which you will be responsible but which will not be directly covered in class will be identified in weekly reading guides, and are covered in the textbook and generally in the introductions to the various laboratory exercises.
6. REEF polling: students are expected to resolve any connectivity issues with their device immediately. These issues are generally due to either: a problem with the wireless function of the device, losing the signal from the router (in which case disconnecting and reconnecting your device will allow you to access the first available router, so will allow you to reconnect more quickly) or interference with bluetooth signals (students will be asked to turn off their bluetooth function(s) at the beginning of class). Depending upon the circumstance and extent of the problem, marks for missed polls may be made using the pEERWise platform. If you cannot attend a seminar and have valid grounds, please e-mail the instructor to provide your documentation. Academic accommodations for instances where a student cannot meet a course requirement, are discussed below.

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8 Department of Molecular and Cellular Biology Statements

8.1 Academic Advisors

If you are concerned about any aspect of your academic program:

- Make an appointment with a program counsellor in your degree program. B.Sc. Academic Advising or Program Counsellors

8.2 Academic Support

If you are struggling to succeed academically:

- Learning Commons: There are numerous academic resources offered by the Learning Commons including, Supported Learning Groups for a variety of courses, workshops related to time management, taking multiple choice exams, and general study skills. You can also set up individualized appointments with a learning specialist. http://www.learningcommons.uoguelph.ca/

- Science Commons: Located in the library, the Science Commons provides support for physics, mathematic/statistics, and chemistry. Details on their hours of operations can be found at: http://www.lib.uoguelph.ca/get-assistance/studying/chemistry-physics-help and http://www.lib.uoguelph.ca/get-assistance/studying/math-stats-help

8.3 Wellness

If you are struggling with personal or health issues:

- Counselling services offers individualized appointments to help students work through personal struggles that may be impacting their academic performance. https://www.uoguelph.ca/counselling/
- Student Health Services is located on campus and is available to provide medical attention. https://www.uoguelph.ca/studenthealthservices/clinic
- For support related to stress and anxiety, besides Health Services and Counselling Services, Kathy Somers runs training workshops and one-on-one sessions related to stress management and high performance situations. http://www.uoguelph.ca/~ksomers/

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9 University Statements

9.1 Email Communication

As per university regulations, all students are required to check their e-mail account regularly: e-mail is the official route of communication between the University and its students.

9.2 When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. The regulations and procedures for Academic Consideration are detailed in the Undergraduate Calendar.

9.3 Drop Date

Courses that are one semester long must be dropped by the end of the fortieth class day; two-semester courses must be dropped by the last day of the add period in the second semester. The regulations and procedures for Dropping Courses are available in the Undergraduate Calendar.

9.4 Copies of Out-of-class Assignments

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

9.5 Accessibility

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student

Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required, however, interim accommodations may be possible while that process is underway.

Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability.

Use of the SAS Exam Centre requires students to book their exams at least 7 days in advance, and not later than the 40th Class Day.

More information: www.uoguelph.ca/sas

9.6 Academic Misconduct

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community – faculty, staff, and students – to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

The Academic Misconduct Policy is detailed in the Undergraduate Calendar.

9.7 Recording of Materials

Presentations which are made in relation to course work—including lectures—cannot be recorded or copied without the permission of the presenter, whether the instructor, a classmate or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

9.8 Resources

The Academic Calendars are the source of information about the University of Guelph's procedures, policies and regulations which apply to undergraduate, graduate and diploma programs.
